



NUCLEAR REGULATORY COMMISSION

[NRC-2022-0130]

High Energy Arcing Fault Hazard Frequency and Consequence Modeling

AGENCY: Nuclear Regulatory Commission.

ACTION: Draft NUREG; request for comment.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is issuing for public comment draft NUREG-2262, "High Energy Arcing Fault Frequency and Consequence Modeling."

DATES: Submit comments by **[INSERT DATE 30 DAYS AFTER PUBLICATION IN THE *FEDERAL REGISTER*]**. Comments received after this date will be considered if it is practical to do so, but the Commission is able to ensure consideration only for comments received on or before this date.

ADDRESSES: You may submit comments by any of the following methods; however, the NRC encourages electronic comment submission through the **Federal rulemaking website**:

- **Federal rulemaking website:** Go to <https://www.regulations.gov> and search for Docket ID **NRC-2022-0130**. Address questions about Docket IDs in Regulations.gov to Stacy Schumann; telephone: 301-415-0624; email: Stacy.Schumann@nrc.gov. For technical questions, contact the individual listed in the "For Further Information Contact" section of this document.

- **Mail comments to:** Office of Administration, Mail Stop: TWFN-7-A60M, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, ATTN: Program Management, Announcements and Editing Staff.

For additional direction on obtaining information and submitting comments, see "Obtaining Information and Submitting Comments" in the SUPPLEMENTARY INFORMATION section of this document.

FOR FURTHER INFORMATION CONTACT: Gabriel J. Taylor, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, telephone: 301-415-0781, email: Gabriel.Taylor@nrc.gov.

SUPPLEMENTARY INFORMATION:

I. Obtaining Information and Submitting Comments

A. Obtaining Information

Please refer to Docket ID **NRC-2022-0130** when contacting the NRC about the availability of information for this action. You may obtain publicly available information related to this action by any of the following methods:

- **Federal Rulemaking Website:** Go to <https://www.regulations.gov> and search for Docket ID **NRC-2022-0130**.

- **NRC's Agencywide Documents Access and Management System (ADAMS):** You may obtain publicly available documents online in the ADAMS Public Documents collection at <https://www.nrc.gov/reading-rm/adams.html>. To begin the search, select "Begin Web-based ADAMS Search." For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by email to PDR.Resource@nrc.gov. The draft NUREG-2262 "High Energy Arcing Fault Frequency and Consequence Modeling" is available in ADAMS under Accession No. ML22158A071.

- **NRC's PDR:** You may examine and purchase copies of public documents, by appointment, at the NRC's PDR, Room P1 B35, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852. To make an appointment to visit the PDR, please send an email to PDR.Resource@nrc.gov or call 1-800-397-4209 or 301-415-4737, between 8:00 a.m. and 4:00 p.m. Eastern Time (ET), Monday through Friday, except Federal holidays.

B. Submitting Comments

The NRC encourages electronic comment submission through the **Federal rulemaking website** (<https://www.regulations.gov>). Please include Docket ID **NRC-2022-0130** in your comment submission.

The NRC cautions you not to include identifying or contact information that you do not want to be publicly disclosed in your comment submission. The NRC will post all comment submissions at <https://www.regulations.gov> as well as enter the comment submissions into ADAMS. The NRC does not routinely edit comment submissions to remove identifying or contact information.

If you are requesting or aggregating comments from other persons for submission to the NRC, then you should inform those persons not to include identifying or contact information that they do not want to be publicly disclosed in their comment submission. Your request should state that the NRC does not routinely edit comment submissions to remove such information before making the comment submissions available to the public or entering the comment into ADAMS.

II. Discussion

The NRC Office of Nuclear Regulatory Research and the Electrical Power Research Institute (EPRI) are advancing the understanding and state-of-practice for modeling High Energy Arcing Faults (HEAF) in fire Probabilistic Risk Assessment. NUREG/CR-6850 and NUREG/CR-6850 Supplement 1 provide the basic methods to analyze the risk associated with HEAFs in power distribution equipment (switchgear and load centers) and bus ducts (including iso-phase bus ducts), respectively. Since the publication of these two reports, the state of knowledge of the HEAF phenomena has advanced significantly. A thorough understanding of the nuclear power plant electrical distribution system and its performance during faulted conditions along with a review and categorization of industry events has occurred. Additionally, experimentation – including full scale testing on HEAF-susceptible equipment, small scale testing, and hazard estimation have increased the understanding of parameters that affect the dimensions of the zone of influence (ZOI).

In draft NUREG-2262 titled, "High Energy Arcing Fault Frequency and Consequence Modeling," the NRC worked with the EPRI to combine previous HEAF-related research, methods, and data to improve realism in calculating plant risk due to HEAFs. Ignition frequency and non-suppression estimates are updated with the most recently available industry operating experience. The ZOI configurations are expanded. Previous guidance postulated one ZOI for each category of equipment (switchgear and load centers, bus ducts, and iso-phase bus ducts). The development and use of HEAF hazard estimation tools allowed for the expansion of ZOI configurations by using scenario specific parameters such as fault current magnitude, arc voltage, duration, location, electrode composition, and type of equipment, to more accurately predict the ZOI. The ZOIs results are grouped by the working group to determine consensus ZOIs for the three classes of equipment with varying levels of detail commensurate with potential risk significance.

The information contained within the draft research information letter is expected to be used in the future as the state-of-the-art method for characterizing the risk to nuclear facilities from a HEAF.

Dated: July 25, 2022.

For the Nuclear Regulatory Commission.

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